

Category: Agricultural

California's agricultural off-road emissions inventory is an estimate of the amount and types of pollutants emitted from thousands of pieces of equipment used in farming applications. These equipment types comprise of 4- stroke gasoline and diesel engines.

The top 5 most popular equipment types in this category are:

Equipment Type	Fuel Type	2000 Population
Agricultural Tractors	D	177031
Tillers	G4	141754
Sprayers	G4	9798
Combines	D	4370
Balers	G4	2577

Agricultural irrigation pumps are not presently included in the OFFROAD model.
[\(Document Link\)](#)

Emissions Inventory:

As with other OFFROAD equipment types, the emissions inventory for the agricultural category is calculated as the product of the emission rate (grams per horsepower-hour), engine population, and activity (hours per year) in annual average use hours.

[Calculating Emissions Inventory \(PDF Format\)](#)

For the current emissions inventory (tons/day):

[Air Resources Board Almanac](#)

Input Data Sources:

The input factors used by the OFFROAD Model come from various data sources:

Input Factor	Source of Data (Gas & Diesel)
Population (base year 2000)	U.S. Dept of Agriculture's Census of Agriculture (1992)
Useful Life	Power Systems Research (1996)
Activity (hr/yr)	Power Systems Research (1996)
Average horsepower	Power Systems Research (1996)
Load factor	Power Systems Research (1996)
Allocation factor	Energy & Environmental Analysis (EEA) (1995)
Growth factor	U.S. Dept of Equalization diesel fuel consumption (1992);

	Energy & Environmental Analysis (EEA) fuel sales (1995); PPI from Bureau of Labor Statistics (1997); Dept of Water Resources - Irrigated Agricultural Acreage for San Joaquin River region (2005)
Survival rate	Power Systems Research (1996)

For more additional background information on the input factors used by the OFFROAD Model: [\(Document Link\)](#)

For tables of input data for agricultural equipment: [\(Document Link\)](#)

Adopted Regulations for Agricultural:

2004: *(Reflected in OFFROAD Model)* Board approved amendment to California's existing off-road diesel regulations to harmonize with USEPA Tier 4 regulation (40 CFR 1039). [\(Document Link\)](#)

2002: *(Reflected in OFFROAD Model)* EPA regulations on large spark-ignited engines. [\(Document Link\)](#)

2000: *(Reflected in OFFROAD Model)* Board approved the emissions inventory for off-road large CI engines (≥ 25 hp) from the OFFROAD Model. [\(Document Link\)](#)

1998: *(Reflected in OFFROAD Model)* Board approved the off-road large spark-ignited engines (≥ 25 hp) regulations. [\(Document Link\)](#)

1998: *(Reflected in OFFROAD Model)* Board approved the emissions inventory for off-road large spark-ignited engines (≥ 25 hp) from the OFFROAD Model. [\(Document Link\)](#)

Future Improvements to the Agricultural Category:

The emissions inventory from the OFFROAD Model strives to accurately represent the 'real-world' as accurately as possible. Therefore, the methodologies and data sources are constantly re-evaluated and updated where applicable. The following items are future improvements for the agricultural category:

- Update population and activity values as new data becomes available
- Revise growth factors using REMI employment data (2001)
- Allocate equipment from the county down to the neighborhood level (GIS)